

January 9, 2014



Mr. Ernesto Vigoreaux
Hardesty Renaissance Economic Development Corporation (HREDC)
c/o 148 North Topping Avenue
Kansas City, MO 64123

Re: Analysis of Brownfields Cleanup Alternatives (ABCA)
Building 10 - Former Hardesty Federal Facility
605 Hardesty Avenue, Kansas City, MO 64124

Dear Mr. Vigoreaux:

Terracon Consultants, Inc. (Terracon) is pleased to provide this Analysis of Brownfields Cleanup Alternatives (ABCA) for abatement of asbestos containing materials (ACMs), lead-based paint (LBP) and hazardous materials (HMs) at Building 10 located at the Former Hardesty Federal Facility. The former Hardesty Federal Facility is located at 605 Hardesty, in Kansas City, Missouri.

The abatement/removal of ACM and LBP may present a health hazard, and removal of ACM and LBP is required for renovation/demolition projects overseen by the United States Environmental Protection Agency (USEPA) and/or Missouri Department of Natural Resources (MDNR) Brownfields/Voluntary Cleanup Program (BVCP). All removal work must comply with all Kansas City, Missouri Health Department, Air Quality Program requirements, as well as various state and federal regulations.

Included in this ABCA are the following:

- Evaluation of the contamination, including description of the ACMs, LBP and HMs at Building 10;
- Evaluation of cleanup alternatives, including implementation and costs for each, taking into consideration USEPA, MDNR and City of KCMO requirements;
- Recommended cleanup alternatives for ACMs, LBP and HMs; and,
- Total cleanup costs for ACMs, LBP and HMs at Building 10

We look forward to working with you on this project. Should you have any questions, please do not hesitate to contact us.

Sincerely,

Allen Bartels
Department Manager Asbestos Services
Senior Asbestos/Lead Practitioner



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Environmental

Facilities

Geotechnical

Materials



**Analysis of Brownfields Cleanup Alternatives
(ABCA)**

**Building 10 - Former Hardesty Federal Facility
605 Hardesty Avenue
Kansas City, Missouri 64124**

January 9, 2014

Prepared for:

**Mr. Ernesto Vigoreaux
Hardesty Renaissance Economic Development Corporation (HREDC)
c/o 148 N. Topping Ave.
Kansas City, MO 64123**

Prepared by:

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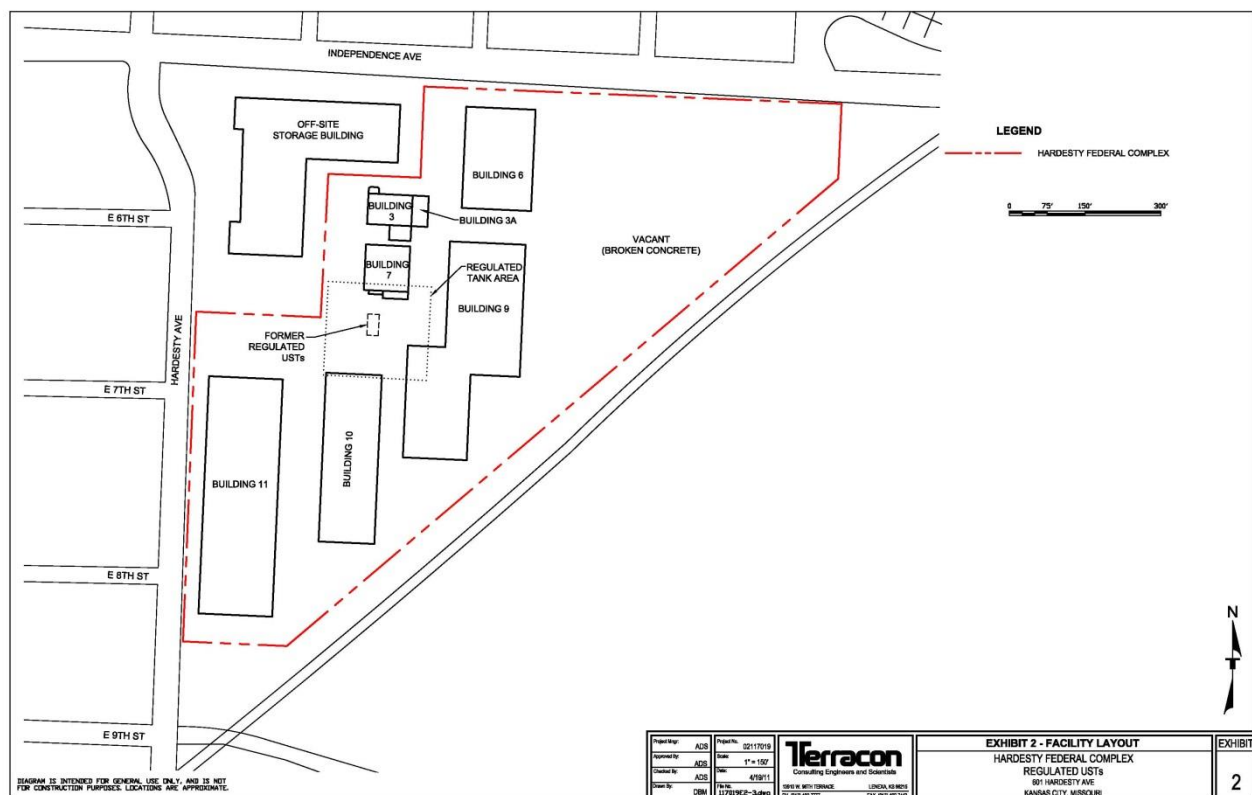
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1.0 LOCATION & PRIOR USE

The Former Hardesty Federal Facility (subject site) encompasses approximately 18 acres, and includes seven (7) main structures/buildings. Building 10 is located at 605 Hardesty Avenue, just south of the intersection Independence and Hardesty Avenues, in Kansas City, Missouri. This building is a two (2)-story structure with basement constructed in 1942 and comprises approximately 86,640 square feet. Figure 1 is a general site location diagram.

Figure 1



The Department of the Army's Quartermaster Corps purchased the subject property and began operating on the site in the 1940s, as a Quartermaster facility to provide supplies for posts, camps and stations in the States of Kansas, Nebraska, Oklahoma, Wyoming, South Dakota and Utah (and later amended to add Missouri and Arkansas). Part of the mission of the Kansas City Quartermaster Depot (KCQD) was to receive and store protective and impermeable clothing, laundry and dry-cleaning supplies, inks, lithographic chemicals, petroleum products, petroleum-handling equipment, reclaim petroleum containers, and procure graphic arts operating supplies and chemicals.

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The KCQD facility continued to provide a variety of support services for various federal agencies after World War II until the site was permanently closed by the United States government in 2002.

The General Services Administration (GSA) acquired the property in 1960. In 1999, GSA determined that the Hardesty Complex represented surplus property to federal needs, and decided to dispose of the facility to private or public entities. The site/buildings have remained vacant since 2002.

2.0 PRIOR ENVIRONMENTAL STUDIES

As part of the sale contract to the current owner, HREDC, the General Services Administration (GSA) has accepted full responsibility to conduct all necessary assessment and remediation of the soil and groundwater contamination to achieve regulatory closure. Regulatory oversight for this work is being provided by the Missouri Department of Natural Resources (MDNR's) Federal Facilities Program.

Numerous environmental investigations have been conducted on the property, dating back to the early 1980s. These studies have focused primarily on the assessment of soil and groundwater contamination, primarily pertaining to chlorinated solvents and petroleum hydrocarbons which have impacted the site as a result of prior land use.

Hazardous materials were identified in the *ENVIRONMENTAL SITE INVESTIGATION REPORT* prepared by SCS Engineers dated November, 2003 and were remediated as reported in the *ENVIRONMENTAL ASSESSMENT AND LOW LEVEL PCB REMEDIATION REPORT* prepared by ESC Engineers dated February 2007. This report indicates the identified hazardous materials are documented to have been properly addressed in the Building 10.

A comprehensive asbestos survey of this Building 10 was conducted in December 2013 that identified both friable and non-friable asbestos containing materials.

A comprehensive lead-based paint survey of Building 10 was conducted in December 2013 that identified the presence of lead-based paint.

A hazardous materials inventory of Building 10 was conducted in December 2013 to identify and quantify PCBs, mercury-containing equipment, CFCs, batteries, and radioactive sources present at the site, typical items that need addressed that were not covered in the SCS Engineers reports referenced above.

3.0 POTENTIAL CLEANUP ALTERNATIVES

The overall goal of a Brownfields cleanup action at the Former Hardesty Federal Complex is to address the environmental conditions preventing or impeding the preferred type of site redevelopment, and to do so in a manner protective of human health and the environment.

It is the desire of HREDC to continue redevelopment of the Hardesty Federal Complex with Building 10, which is located just east of Building 11. Based on the environmental studies conducted to-date by GSA, there is no evidence that this area of the site has been significantly impacted by soil and/or groundwater contamination. Surveys of Building No. 10 have identified asbestos-containing materials (ACMs), lead-based paints (LBPs) and hazardous materials (HMs) inside the structure.

As part of the sale contract, HREDC is responsible for abatement of any ACMs, LBPs and HMs necessary to rehabilitate any structure at the site for future land use. The purpose of this Analysis of Brownfield Cleanup Alternatives (ABCA) is to present viable cleanup alternatives based on site-specific conditions, technical feasibility, and preliminary cost evaluation. Each alternative is evaluated in terms of its effectiveness, implementation ability, and cost.

The following sections describe Brownfields alternatives for addressing the ACMs, LBPs and HMs identified in Building 10, including the “No Action” alternative. Due to water damage and that the building has remained vacant for many years, most of the interior furnishings (e.g. gypsum wallboard walls, floor coverings, etc.) will need to be physically removed and disposed of that are not removed in conjunction any abatement activities associated with ACM and LBP removal. As such, the abatement of any intact LBPs will be achieved as part of any required demolition work associated with future construction work, and will be incorporated in the construction specifications.

The criterion used to assess the effectiveness of a remedial alternative, based upon its ability to meet the objectives of the Brownfields cleanup, include the following:

- Overall protection of public health and the environment
- Compliance with applicable regulatory requirements, advisories, and guidance documents
- Long-term effectiveness
- Reduction of toxicity, mobility, or volume through treatment/removal
- Short-term effectiveness

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Criteria used to assess implement ability or an alternative are:

- Technical feasibility
- Administrative feasibility
- Availability of services and materials
- State acceptance
- Community acceptance

Each alternative is evaluated to determine its estimated cost. The evaluations compare among the alternatives direct capital costs, which include equipment, services, and contingency allowances. The purpose of evaluating each alternative is to determine its advantages and disadvantages relative to the other alternative in order to identify key tradeoffs that would affect selection of the preferred alternative.

4.0 EVALUATED CONTAMINATION

Contaminants and items possibly containing hazardous materials, which have been evaluated as part of this ABCA, include ACM, LBP and HM.

4.1 Asbestos-Containing Materials (ACMs)

A comprehensive asbestos survey of this building was conducted in December 2013. USEPA accredited and State of Missouri certified asbestos inspectors conducted the survey, and the samples were submitted to an NVLAP accredited laboratory for analysis utilizing polarized light microscopy with dispersion staining. A summary of the friable and non-friable ACMs identified in Building 10 and the approximate quantity of each is provided below in Table 1.

TABLE 1
IDENTIFIED ASBESTOS CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)

| HA | HA MATERIAL DESCRIPTION | HA MATERIAL LOCATION | TYPE ASBESTOS** | FRIABILITY | CONDITION | ESTIMATED QUANTITY* |
|----|--|---|--------------------------------|------------|-----------|---------------------|
| 01 | Preformed Mag./Cal. Pipe Insulation | Basement - west tunnel, NW area, bathroom | 10% Amosite 5% Chrysotile | Friable | Damaged | 185 Linear Ft. |
| 02 | Mudded Joint Packings With Preformed Mag./Cal. Block Pipe Insulation | Basement - west tunnel, NW area, bathroom | 10% Amosite; 65% Chrysotile | Friable | Damaged | 20 Joint(s) |
| 03 | Corrugated Pipe Insulation | Basement - west tunnel, east tunnel, north center area, along east wall, bathroom. 1st floor - NE room, east center rooms, bathroom. 2nd floor - east center room, bathroom. | 50% Chrysotile | Friable | Damaged | 750 Linear Ft. |
| 04 | Mudded Joint Packings With Corrugated Pipe Insulation | Basement - west tunnel, east tunnel, north center area, along east wall, bathroom. 1st floor - NE room, east center rooms, bathroom. 2nd floor - east center room, bathroom. | 10% Amosite; 65% Chrysotile | Friable | Damaged | 125 Joint(s) |

| HA | HA MATERIAL DESCRIPTION | HA MATERIAL LOCATION | TYPE ASBESTOS** | FRIABILITY | CONDITION | ESTIMATED QUANTITY* |
|----|--|--|----------------------------------|-------------|-----------|---------------------|
| 05 | Layered Paper Pipe Insulation | Basement - west tunnel, east tunnel, north center area, east center area, along west wall, at north and south stairs, bathroom pipe chase. 1st floor - bathroom and bathroom pipe chase. 2nd floor - bathroom pipe chase, at north and south stairs. | 50% Chrysotile | Friable | Damaged | 1,050 Linear Ft. |
| 06 | Mudded Joint Packings With Layered Paper Pipe Insulation | Basement - west tunnel, east tunnel, north center area, east center area, along west wall, at north and south stairs, bathroom pipe chase. 1st floor - bathroom and bathroom pipe chase. 2nd floor - bathroom pipe chase, at north and south stairs. | 65% Chrysotile | Friable | Damaged | 200 Joint(s) |
| 07 | Mudded Joint Packings With Fiberglass Pipe Insulation | Basement - bathroom and shower room. | 2% Amosite 2% Chrysotile | Friable | Damaged | 60 Joint(s) |
| 10 | Brown 9" x 9" Floor Tile and Mastic | 1st floor throughout except in north center area and NE room, in checkerboard pattern with 9"x9" black floor tile. | 10% Chrysotile | Non Friable | Damaged | 12,500 Sq. Ft. |
| 11 | Black 9" x 9" Floor Tile and Mastic | 1st floor throughout except in north center area and NE room, in checkerboard pattern with 9"x9" brown floor tile. | 10% Chrysotile | Non Friable | Damaged | 12,500 Sq. Ft. |
| 12 | 12" x 12" Floor Tile and Mastic | 1st floor - east center room. | 5% Chrysotile | Non Friable | Good | 900 Sq. Ft. |
| 13 | Mastic Beneath Sheet Flooring/Paper (Linoleum) | 2nd floor - NE area. | 5% Chrysotile | Non Friable | Good | 360 Sq. Ft. |
| 14 | Leveling compound | 1st floor - north center. | 5% Chrysotile | Non Friable | Damaged | 500 Sq. Ft. |
| 15 | Cement Pipes | Basement - north center area at ceiling, NE electric room, bathroom. 1st floor bathroom. Exterior at east center of building. | 15% Chrysotile 5% Crocidolite | Non Friable | Damaged | 175 Linear Ft. |
| 16 | Cement Panels | Exterior – covering windows of 2 nd floor | 15% Chrysotile | Non Friable | Damaged | 2500 Sq. Ft. |
| 17 | Cement Panels | Basement – north side of NE electric room in electric panel | 15% Chrysotile | Non Friable | Damaged | 10 Sq. Ft. |

| HA | HA MATERIAL DESCRIPTION | HA MATERIAL LOCATION | TYPE ASBESTOS** | FRIABILITY | CONDITION | ESTIMATED QUANTITY* |
|----|-------------------------|------------------------------------|-----------------|------------|-----------|---------------------|
| 20 | Window Caulking | Exterior – at perimeter of windows | 10% Chrysotile | Friable | Damaged | 420 Windows |

***Estimated quantities** are based on a cursory field evaluation, and actual quantities may vary significantly, especially if asbestos containing materials are present in hidden and/or inaccessible areas not evaluated as part of this survey.

% & **Type Asbestos = this column contains both the analytical result of the sample with the highest concentration of asbestos detected in the samples that make up the HA and the types of asbestos identified.

MATERIALS CONTAINING 1% OR LESS ASBESTOS BY HA

| HA # | HA MATERIAL DESCRIPTION | HA MATERIAL LOCATION |
|------|---|--|
| 08 | Gypsum Wallboard with Joint Compound & Tape | Basement - east side storerooms. 1st floor - interior walls throughout. 2nd floor - north center storage area. |
| 09 | Gypsum board air ducts | Basement, 1st and 2nd floors - running along center areas at ceilings branching to side areas. |

**The gypsum wallboard tested negative for asbestos, the joint compound tested positive for asbestos. The EPA and State of Missouri allow the laboratory to composite the joint compound and the gypsum wallboard materials together and treat the sample as one material. In this case, the composited analysis is less than 1% asbestos, which means the gypsum wallboard and joint compound composite material is considered not a asbestos-containing material.*

Please note, that friable ACM and nonfriable ACM that is damaged to the extent that it is friable, need to be abated by a State of Missouri licensed asbestos abatement contractor prior to demolition or renovation activities that may disturb these materials. Non-friable ACM such as the cementitious panels need to be abated by a State of Missouri licensed asbestos abatement contractor prior to demolition activities, if the materials will be crumbled, pulverized or reduced to powder. Additionally, non-friable asbestos-containing material floor tile and mastic needs to be abated prior to renovation and/or demolition activities that disturb the materials and render them friable.

4.2 Lead-Based Paint (LBP)

A comprehensive lead-based paint survey of this building was conducted in December 2013. A State of Missouri licensed lead inspector conducted the survey using an X-Ray Fluorescence Spectrometer to determine if surface coatings contain lead. In addition, the inspector collected paint chip samples and submitted samples under chain of custody to QuanTEM Laboratories of Oklahoma City, Oklahoma for analysis by United States Environmental Protection Agency (USEPA) methodology 7000B (1). Lead content in samples were reported in percent lead by weight.

A summary of LBP identified in Building 10, and the condition and approximate quantity of each, is provided below in Table 2.

TABLE 2
IDENTIFIED LEAD-BASED PAINT BY LOCATION

| Location | Color | Condition | Approximate Quantity |
|-----------------------------|-----------------|-----------|----------------------|
| Basement Columns | Yellow | Peeling | 3,400 Square Feet |
| Basement Windows | Gray | Peeling | 500 Square Feet |
| Basement Doors | Gray | Peeling | 500 Square Feet |
| Basement Handrails | Gray | Peeling | 250 Square Feet |
| 1st Floor Gypsum Wallboard | Orange | Peeling | 12,000 Square Feet |
| 1st Floor Windows | Tan | Peeling | 1,000 Square Feet |
| 1st Floor Doors | Pink, Red, Blue | Peeling | 1,000 Square Feet |
| 1st Floor Garage Doors | Orange, Tan | Peeling | 1,500 Square Feet |
| 1st Floor Baseboards | Black | Peeling | 1,000 Square Feet |
| 1st Floor Radiators | Brown | Peeling | 850 Square Feet |
| 2nd Floor Concrete Walls | Green | Peeling | 15,000 Square Feet |
| 2nd Floor Concrete Columns | Tan, Green | Peeling | 3,500 Square Feet |
| 2nd Floor Wood Windows | Green | Peeling | 1,000 Square Feet |
| 2nd Floor Wood Handrails | Yellow | Peeling | 250 Square Feet |
| Exterior – Wood Windows | Gray | Peeling | 750 Square Feet |
| Exterior – Wood Awning | Gray | Peeling | 3,800 Square Feet |
| Exterior – Wood Garage Door | Blue | Peeling | 800 Square Feet |

4.3 Hazardous Materials (HM) Inventory

An HM inventory of Building 10 was conducted in December 2013 to identify and quantify PCBs, mercury-containing equipment, CFCs, batteries, and radioactive sources.

Items identified are:

1. PCB Light Ballasts – approximately 360
2. Fluorescent Light Tubes – approximately 725
3. Thermostat Switches - 5
4. Exit Signs - 5

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Other hazardous materials listed in the *ENVIRONMENTAL SITE INVESTIGATION REPORT* prepared by SCS Engineers dated November, 2003 were addressed and documented in the *ENVIRONMENTAL ASSESSMENT AND LOW LEVEL PCB REMEDIATION REPORT* prepared by ESC Engineers dated February 2007 and are documented to have been properly addressed in the building.

5.0 EVALUATION OF CLEANUP ALTERNATIVES

The roof has deteriorated over the years resulting in water intrusion into the building. Windows are cracked or broken out in many locations resulting in water intrusion. Pigeons have taken over the entire first floor contaminating it with their droppings creating a biological hazard. Surfaces that are painted are peeling extensively. Thermal system insulation is damaged in most areas.

Given the above condition statement, cleanup alternatives are limited for ACM, LBP and HM. Evaluations of cleanup alternatives have been developed with specific consideration to USEPA and Missouri Department of Natural Resources (MDNR) Brownfields/Voluntary Cleanup Program (MDNR-BVCP) procedural requirements.

5.1 Asbestos-Containing Materials

Alternative 1: No Action

Alternative 1: consists of leaving the ACM in-place at the site.

Effectiveness

This alternative would be ineffective in achieving the goal of reduction of health risks and future redevelopment of Building 10.

Implementation

Implementation of this alternative is straightforward – seal off the building and abandon it place.

Cost

This alternative would not involve any direct remediation costs.

Alternative 2: Abatement/Removal of Identified ACMs

Alternative 2 involves proper abatement of all identified ACM at the site, as stated in Table 1 above. Abatement would be conducted in accordance with all applicable local, state, and federal regulations by a licensed Missouri Asbestos abatement contractor. Regulatory clearance would be obtained through successful implementation of a preapproved Remedial Action Plan, including clearance sampling and pre/during/post inspections by Kansas City Air Quality. Any sampling for clearance would have to be performed in

accordance with a pre-approved Quality Assurance Project Plan (QAPP), per federal cooperative agreement if Brownfields Revolving Loan Funds grants are used.

Effectiveness

If all of the identified ACM is removed, this alternative would be most effective in removing risk to human health and the environment posed by the ACM. In addition, full abatement would allow for redevelopment of the site without the need for restrictions.

Implementation

Implementation requires the development of procedures and work practices in compliance with MDNR's Publication 2099 entitled "Asbestos and Lead-Based Paint Abatement Requirements at Brownfields/Voluntary Cleanup Program Sites" (MDNR 2009). The abatement would be conducted in accordance with all applicable local, state, and federal regulations by a Missouri licensed asbestos abatement contractor. ACM identified at the site includes all materials identified in Table 1 above.

Cost

Estimated abatement costs were prepared based on similar work under similar building conditions. The estimated costs listed below include costs associated with labor, materials, notification and inspection fees, and disposal costs. A summary of ACM removal estimates are provided below in Table 3.

TABLE 3
IDENTIFIED ASBESTOS CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)
REMOVAL ESTIMATE

| HA | HA MATERIAL DESCRIPTION | HA MATERIAL LOCATION | TYPE ASBESTOS** | FRIABILITY | CONDITION | ESTIMATED QUANTITY* |
|--|--|---|--------------------------------|------------|-----------|---------------------|
| 01 | Preformed Mag./Cal. Pipe Insulation | Basement - west tunnel, NW area, bathroom | 10% Amosite 5% Chrysotile | Friable | Damaged | 185 Linear Ft. |
| Removal Estimate Between \$2,775 and \$3,700 | | | | | | |
| 02 | Mudded Joint Packings With Preformed Mag./Cal. Block Pipe Insulation | Basement - west tunnel, NW area, bathroom | 10% Amosite; 65% Chrysotile | Friable | Damaged | 20 Joint(s) |
| Removal Estimate Between \$300 and \$400 | | | | | | |

| HA | HA MATERIAL DESCRIPTION | HA MATERIAL LOCATION | TYPE ASBESTOS** | FRIABILITY | CONDITION | ESTIMATED QUANTITY* |
|--|--|--|-----------------------------|------------|-----------|---------------------|
| 03 | Corrugated Pipe Insulation | Basement - west tunnel, east tunnel, north center area, along east wall, bathroom. 1st floor - NE room, east center rooms, bathroom. 2nd floor - east center room, bathroom. | 50% Chrysotile | Friable | Damaged | 750 Linear Ft. |
| Removal Estimate Between \$11,250 and \$15,000 | | | | | | |
| 04 | Mudded Joint Packings With Corrugated Pipe Insulation | Basement - west tunnel, east tunnel, north center area, along east wall, bathroom. 1st floor - NE room, east center rooms, bathroom. 2nd floor - east center room, bathroom. | 10% Amosite; 65% Chrysotile | Friable | Damaged | 125 Joint(s) |
| Removal Estimate Between \$1,875 and \$2,500 | | | | | | |
| 05 | Layered Paper Pipe Insulation | Basement - west tunnel, east tunnel, north center area, east center area, along west wall, at north and south stairs, bathroom pipe chase. 1st floor - bathroom and bathroom pipe chase. 2nd floor - bathroom pipe chase, at north and south stairs. | 50% Chrysotile | Friable | Damaged | 1,050 Linear Ft. |
| Removal Estimate Between \$15,750 and \$21,000 | | | | | | |
| 06 | Mudded Joint Packings With Layered Paper Pipe Insulation | Basement - west tunnel, east tunnel, north center area, east center area, along west wall, at north and south stairs, bathroom pipe chase. 1st floor - bathroom and bathroom pipe chase. 2nd floor - bathroom pipe chase, at north and south stairs. | 65% Chrysotile | Friable | Damaged | 200 Joint(s) |
| Removal Estimate Between \$3,000 and \$4,000 | | | | | | |
| 07 | Mudded Joint Packings With Fiberglass Pipe Insulation | Basement - bathroom and shower room. | 2% Amosite 2% Chrysotile | Friable | Damaged | 60 Joint(s) |
| Removal Estimate Between \$900 and \$1,200 | | | | | | |

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| HA | HA MATERIAL DESCRIPTION | HA MATERIAL LOCATION | TYPE ASBESTOS** | FRIABILITY | CONDITION | ESTIMATED QUANTITY* |
|--|--|---|----------------------------------|-------------|-----------|---------------------|
| 10 | Brown 9" x 9" Floor Tile and Mastic | 1st floor throughout except in north center area and NE room, in checkerboard pattern with 9"x9" black floor tile. | 10% Chrysotile | Non Friable | Damaged | 12,500 Sq. Ft. |
| Removal Estimate Between \$25,000 and \$37,500 | | | | | | |
| 11 | Black 9" x 9" Floor Tile and Mastic | 1st floor throughout except in north center area and NE room, in checkerboard pattern with 9"x9" brown floor tile. | 10% Chrysotile | Non Friable | Damaged | 12,500 Sq. Ft. |
| Removal Estimate Between \$25,000 and \$37,500 | | | | | | |
| 12 | 12" x 12" Floor Tile and Mastic | 1st floor - east center room. | 5% Chrysotile | Non Friable | Good | 900 Sq. Ft. |
| Removal Estimate Between \$1,800 and \$2,700 | | | | | | |
| 13 | Mastic Beneath Sheet Flooring/Paper (Linoleum) | 2nd floor - NE area. | 5% Chrysotile | Non Friable | Good | 360 Sq. Ft. |
| Removal Estimate Between \$1,800 and \$3,600 | | | | | | |
| 14 | Leveling compound | 1st floor - north center. | 5% Chrysotile | Non Friable | Damaged | 500 Sq. Ft. |
| Removal Estimate Between \$1,500 and \$2,000 | | | | | | |
| 15 | Cement Pipes | Basement - north center area at ceiling, NE electric room, bathroom. 1st floor bathroom. Exterior at east center of building. | 15% Chrysotile 5% Crocidolite | Non Friable | Damaged | 175 Linear Ft. |
| Removal Estimate Between \$875 and \$1,750 | | | | | | |
| 16 | Cement Panels | Exterior – covering windows of 2 nd floor | 15% Chrysotile | Non Friable | Damaged | 2500 Sq. Ft. |
| Removal Estimate Between \$12,500 and \$25,000 | | | | | | |
| 17 | Cement Panels | Basement – north side of NE electric room in electric panel | 15% Chrysotile | Non Friable | Damaged | 10 Sq. Ft. |
| Removal Estimate Between \$50 and \$100 | | | | | | |
| 20 | Window Caulking | Exterior – at perimeter of windows | 10% Chrysotile | Friable | Damaged | 420 Windows |
| Removal Estimate Between \$21,000 and \$25,200 | | | | | | |

Total estimated removal costs are between \$125,375 and \$183,150. Technical oversight and clearance sampling would be necessary. Development of procedures and work practices in compliance with MDNR's Publication 2099 entitled "Asbestos and Lead-Based Paint Abatement Requirements at Brownfields/Voluntary Cleanup Program Sites" (MDNR 2009), technical oversight and clearance sampling are estimated between \$35,000.00 and \$45,000.

Incorporating all costs discussed above, the total estimated cost for abatement of identified ACMs is between \$160,375 and \$228,150. Prevailing wage requirements in effect, may increase the cost estimates by as much as 28%, to between \$205,280 and \$292,032.

Alternative 3: Abatement of Identified Friable ACMs Only

Alternative 3 involves proper abatement of the identified friable ACMs and damaged non-friable ACMs at the site, as stated above in Table 3 with the exception of HAS 12 and 13. Abatement would be conducted in accordance with all applicable local, state, and federal regulations by a licensed Missouri Asbestos abatement contractor. Regulatory clearance would be obtained through successful implementation of a preapproved Remedial Action Plan, including clearance sampling and pre/during/post inspections by Kansas City Air Quality. Any sampling for clearance would have to be performed in accordance with a pre-approved Quality Assurance Project Plan (QAPP), per federal cooperative agreement if Brownfields Revolving Loan Funds grants are used.

Effectiveness

If all of the identified friable ACMs and damaged non-friable ACMs are removed, Alternative 3 would be cost effective in removing the risk to human health and the environment. The management of non-friable ACMs, that remains in-place, will require implementation of an Asbestos Operations and Maintenance (O&M) Plan.

Implementation

Implementation requires the development of procedures and work practices in compliance with MDNR's Publication 2099 entitled "Asbestos and Lead-Based Paint Abatement Requirements at Brownfields/Voluntary Cleanup Program Sites" (MDNR 2009). In addition, the ACM floor tile and mastic and sheet flooring would be left in-place. Future redevelopment plans would have to consider locations and condition of the ACM and ensure those areas/materials would not be disturbed. An Asbestos Operations & Maintenance Plan (O&M Plan) would be required to document the presence and location of ACMs, and future maintenance procedures regarding the ACMs. In addition, filing the

Asbestos O&M Plan on the property's chain of title as an institutional control would be required by MDNR-BVCP.

Cost

Total estimated removal costs are between \$121,775 and \$176,850. Development of procedures and work practices in compliance with MDNR's Publication 2099 entitled "Asbestos and Lead-Based Paint Abatement Requirements at Brownfields/Voluntary Cleanup Program Sites" (MDNR 2009), technical oversight and clearance sampling, and development of an Asbestos Operations and Maintenance (O&M) Plan would be necessary. Technical oversight and clearance sampling are estimated between \$35,000.00 and \$45,000. Development of an Asbestos O&M Plan is estimated at \$2,500.

Incorporating all costs discussed above, the total estimated cost for abatement of identified ACMs is between \$159,275 and \$225,350. Prevailing wage requirements in effect, may increase the cost estimates by as much as 28%, to between \$203,872 and \$287,168.

5.2 Lead-Based Paint (LBP)

Alternative 1: No Action

Alternative 1: consists of leaving LBP in-place without disturbing it at the site.

Effectiveness

This alternative would be ineffective in achieving the goal of reduction of health risks and future redevelopment of Building 10.

Implementation

Implementation of this alternative is straightforward – seal off the building and abandon in-place.

Cost

This alternative would not involve any direct remediation costs.

Alternative 2: Repair/Remove/Stabilize Peeling Paint

Alternative 2: consists of the removal of flaking and peeling lead-based paint and lead-based paint dust that may be a hazard to human health or the environment.

Effectiveness

This alternative would be effective in achieving the goal of reduction of health risks and future redevelopment of Building 10.

Implementation

Implementation requires the development of procedures and work practices in compliance with MDNR's Publication 2099 entitled "Asbestos and Lead-Based Paint Abatement Requirements at Brownfields/Voluntary Cleanup Program Sites" (MDNR 2009). In addition, the LBP would be left in-place. Future redevelopment plans would have to consider locations and condition of the LBP in future redevelopment of the building. An LBP Operations & Maintenance Plan (O&M Plan) would be required to document the presence and location of LBP, and future maintenance procedures regarding the LBP. In addition, filing the LBP O&M Plan on the property's chain of title as an institutional control would be required by MDNR-BVCP.

Cost

Estimated repair/removal/stabilization costs were prepared based on similar work under similar building conditions. The estimated costs listed below include all costs associated with labor, materials, removal and disposal costs. A summary of LBP repair/removal/stabilization estimates are provided below in Table 4.

TABLE 4
IDENTIFIED LEAD-BASED PAINT BY LOCATION

| Location | Color | Condition | Approximate Quantity | Removal/Stabilization Estimate |
|----------------------------|-----------------|-----------|----------------------|--------------------------------|
| Basement Columns | Yellow | Peeling | 3,400 Square Feet | \$10,200 to \$13,600 |
| Basement Windows | Gray | Peeling | 500 Square Feet | \$2,250 to \$2,750 |
| Basement Doors | Gray | Peeling | 500 Square Feet | \$2,250 to \$2,750 |
| Basement Handrails | Gray | Peeling | 250 Square Feet | \$1,125 to \$1,375 |
| 1st Floor Gypsum Wallboard | Orange | Peeling | 12,000 Square Feet | \$20,000 to \$25,000 |
| 1st Floor Windows | Tan | Peeling | 1,000 Square Feet | \$4,500 to \$5,500 |
| 1st Floor Doors | Pink, Red, Blue | Peeling | 1,000 Square Feet | \$4,500 to \$5,500 |
| 1st Floor Garage Door | Orange, Tan | Peeling | 1,500 Square Feet | \$5,250 to \$6,750 |

| | | | | |
|-----------------------------|------------|---------|--------------------|----------------------|
| 1st Floor Baseboard | Black | Peeling | 1,000 Square Feet | \$2,500 to \$3,000 |
| 1st Floor Radiators | Brown | Peeling | 850 Square Feet | \$2,000 to \$2,500 |
| 2nd Floor Concrete Walls | Green | Peeling | 15,000 Square Feet | \$52,500 to \$67,500 |
| 2nd Floor Concrete Columns | Tan, Green | Peeling | 3,500 Square Feet | \$12,250 to \$15,750 |
| 2nd Floor Wood Windows | Green | Peeling | 1,000 Square Feet | \$4,500 to \$5,500 |
| 2nd Floor Wood Handrails | Yellow | Peeling | 250 Square Feet | \$1,125 to \$1,375 |
| Exterior – Wood Window | Gray | Peeling | 750 Square Feet | \$3,375 to \$4,125 |
| Exterior – Wood Awning | Gray | Peeling | 3,800 Square Feet | \$17,100 to \$20,900 |
| Exterior – Wood Garage Door | Blue | Peeling | 800 Square Feet | \$3,600 to \$4,400 |

Total estimated repair/removal/stabilization costs are between \$149,275 and \$188,275. Technical oversight and clearance sampling would be necessary. Development of procedures and work practices and a Lead Operations and Maintenance (O&M) Plan in compliance with MDNR's Publication 2099 entitled "Asbestos and Lead-Based Paint Abatement Requirements at Brownfields/Voluntary Cleanup Program Sites" (MDNR 2009), technical oversight and clearance sampling are estimated between \$37,500 and \$47,500.

Incorporating all costs discussed above, the total estimated cost for abatement of identified LBP is between \$186,775 and \$235,775. Prevailing wage requirements in effect, may increase the cost estimates by as much as 28%, to between \$239,072 and \$301,792.

Alternative 3: Complete Removal LBP

Alternative 3: consists of the complete removal of all lead-based paint and lead-based paint dust that may be a hazard to human health or the environment.

Effectiveness

This alternative would be effective in achieving the goal of reduction of health risks and future redevelopment of Building 10.

Implementation

Implementation requires the development of procedures and work practices in compliance with MDNR's Publication 2099 entitled "Asbestos and Lead-Based Paint Abatement Requirements at Brownfields/Voluntary Cleanup Program Sites" (MDNR 2009).

Cost

Total estimated cost to remove identified lead base paint is between \$750,000 and \$900,000. Technical oversight and clearance sampling would be necessary. Development of procedures and work practices and a Lead Operations and Maintenance (O&M) Plan in compliance with MDNR's Publication 2099 entitled "Asbestos and Lead-Based Paint Abatement Requirements at Brownfields/Voluntary Cleanup Program Sites" (MDNR 2009), technical oversight and clearance sampling are estimated between \$75,000.00 and \$125,000.

Incorporating all costs discussed above, the total estimated cost for abatement of identified LPB is between \$825,000 and \$1,025,000. Prevailing wage requirements in effect, may increase the cost estimates by as much as 28%, to between \$1,056,000 and \$1,312,000.

5.3 Hazardous Materials (HMs)

Alternative 1: No Action

Alternative 1: consists of leaving the HMs in-place at the site.

Effectiveness

This alternative would be ineffective in achieving the goal of reduction of health risks and future redevelopment of Building 10.

Implementation

Implementation of this alternative is straightforward – seal off the building and abandon it place.

Cost

This alternative would not involve any direct remediation costs.

Alternative 2: Removal of Identified HMs

Alternative 2 involves the removal intact, segregation, packaging and recycling of identified mercury-containing lights, PCB containing light ballasts, and exit sign batteries in accordance with applicable state and federal regulations prior to renovation of the building..

Effectiveness

This alternative would be most effective in removing risk to human health and the environment posed by the HMs. This alternative would allow for redevelopment of the site without the need for restrictions.

Implementation

Implementation requires the development of procedures and work practices in compliance with all applicable local, state, and federal regulations.

Cost

The estimated costs to remove approximately 360 PCB Light Ballasts, approximately 725 Fluorescent Light Tubes, 5 Thermostat Switches, and 5 Exit Signs is between \$9,000 and \$12,000.

6.0 RECOMMENDED CLEANUP ALTERNATIVES

6.1 Asbestos-Containing Materials (ACMs)

Alternative 2: Complete abatement is the recommended cleanup alternative for ACM identified at the site. This alternative would be effective in removing ACM located at the site, as well as removing the risk to human health posed by the ACM. In addition, this alternative would allow redevelopment of the site without restrictions.

6.2 Lead-Based Paint (LBP)

Alternative 2: Repair/remove/stabilize is the recommended cleanup alternative for LBP identified at the site. This alternative would be effective in remediating the LBP hazard located at the site, as well as removing the risk to human health posed by the peeling LBP. In addition, this alternative would allow redevelopment of the site without restrictions.

6.3 Hazardous Materials (HMs)

Alternative 2: Complete removal and disposal/recycling of the HMs is the recommended cleanup alternative. This alternative would allow redevelopment of the site without restrictions.

7.0 TOTAL CLEANUP COSTS

Based on the recommended cleanup alternatives for ACM, LBP and HW, the estimated total cleanup cost is between \$408,552 and \$548,160.

Additional cost consideration under enrollment in the MDNR-BVCP is preparation of a Quality Assurance Protection Program (QAPP), a Remedial Action Plan (RAP) and a Final Closeout Report. Preparation of the QAPP and RAP and Final Closeout Report costs are estimated between \$10,000 and \$15,000.

It is important to recognize that these costs vary depending on various factors, such as: the abatement techniques used; time of the year the work is performed, new or revised regulatory requirements, etc. Other considerations given the general poor condition of the windows and the amount of ACM and LBP present on them, if they are removed intact, then some type of put-back is required.

8.0 REFERENCES

Asbestos Survey – Building No. 10, Hardesty Federal Complex, Kansas City, Missouri, prepared by Terracon, dated January 9, 2014.

Lead-Based Paint Survey – Building No. 10, Hardesty Federal Complex, Kansas City, Missouri, conducted by Terracon, dated January 9, 2014.

Hazardous Materials Inventory – Building No. 10, Hardesty Federal Complex, Kansas City, Missouri, conducted by Terracon, dated January 9, 2014.

Groundwater Sampling Report for July 2011, Hardesty Federal Complex, Kansas City, Missouri, prepared by Terracon, dated September 13, 2011.

GSA Hardesty Federal Records Center Environmental Assessment and Low Level PCB Remediation Report, prepared by SCS Engineers, dated February 26, 2007.

Phase I Environmental Site Assessment, Former Hardesty Federal Facility, Kansas City, Missouri, prepared by FINE Environmental, Inc., dated August 31, 2011.

Regulated Tanks Site Characterization Report, Hardesty Federal Facility, Kansas City, Missouri, prepared by Terracon, dated May 31, 2012.

RI-FS Work Plan, Hardesty Federal Complex, Kansas City, Missouri; prepared by Terracon, dated August 10, 2012